**User’s Guide: Weighted Summation Model**

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1. Open ‘Model Ready To Use’ .xlsm workbook
2. Enable Macros by clicking the ‘Enable Content’ button and make sure workbook is displaying the ‘Input MOE’ tab.
3. Determine and review the following data before continuing. Make sure all of the following have been determined before plugging anything into the model

* **Measures of Effectiveness (Criteria):** These are your measures or tests which reflect the degree of attainment of particular objectives. Enter as a text name in the model.
* **Weight:** This is the percentage weight that each Measure of Effectiveness has on the final project. Enter as a fraction of one, using a decimal point. ***The sum should always equal 1.0.***
* **Value Sign:** This identifies whether the Measure of Effectiveness has a negative or positive effect on the value of the project. Enter +1 if the *value* of the project increases as the Measure of Effectiveness score increases. Enter -1 if the value of the project decreases as the Measure of Effectiveness score increases. Choose one of these options from the drop down list in each row (See *Figure 1* below).
* **Alternative Options:** These are the different proposed solutions to complete the project. Enter as a text name in the model.
* **Measure of Effectiveness Scores:** These are the raw data numbers that have been determined for each Measure of Effectiveness for each Alternative Option. These will be entered during Step 7.

1. Carefully enter each Measure of Effectiveness, along with its correlating Weight and Value Sign. Click the ‘Add Measure of Effectiveness’ button to create additional rows in the table for additional Measures of Effectiveness. To delete a row, right click anywhere on the row and select **Delete > Delete Table Rows**. It is okay to leave table rows blank below the complete list, but make sure there are no blank rows between two criteria.

|  |  |  |
| --- | --- | --- |
| **Measure of Effectiveness (Criteria)** | **Weight** | **Value Sign** |
| Funding Potential | 0.25 | +1 |
| Total Cost | 0.25 | -1 |
| Predicted Accident Reduction | 0.25 | +1 |
| Acres of Wetland Impacted | 0.25 | -1 |

***Figure 1: Sample data entry***

*Figure 1 Description: Enter a new line for each Measure of Effectiveness, assign it a weight as a decimal of 1, and a value sign. The value sign indicates whether the value of the project increases or decreases as the value of the measure increases. For example, as the total cost of the project increases, the value of the project decreases, thus it is assigned a value of -1. Whereas an increasing number of accidents reduced indicates that the value of the project goes up, so this measure is assigned a value of +1.*

1. Carefully enter each Alternative Option in the ‘Alternative Options’ table. Click the ‘Add Alternative’ button to create additional rows in the table for additional Alternatives. To delete a row, right click on the row and select **Delete > Delete Table Rows**. It is okay to leave rows blank below the complete list, but make sure there are no blank rows between two alternatives.
2. Once all data required by Steps 4 & 5 have been entered, click the ‘Create Matrix’ button. This will populate another table with the information you just entered in Steps 4 & 5, and will bring you to this new table in the ‘Weight Matrix’ worksheet.
3. Enter each Measure of Effectiveness Score that applies to each Alternative Option. When finished, the entire table on the ‘Weight Matrix’ worksheet should be filled in.
4. Click the ‘Generate Final Ranking’ button. This will calculate and populate the tables in the ‘Normalized Values’ and ‘Weighted Values’ tabs, and rank the final weighted scores from highest to lowest on the ‘Ranking’ tab. You will end up on the ‘Ranking’ tab where your alternative options will be ranked from highest to lowest.

*Note 1*: The ‘Final Score’ column is the ‘Raw Score’ column multiplied by 100. This is done to create easier numbers to work with when reviewing the final rankings.

*Note 2:* Some or all final scores may be negative, which means the overall value of the alternative is negative. However, the magnitude of the weighted score has no units, and is best interpreted as a relative value as compared to the other alternative’s values. This is better illustrated by the normalized scores, which compares the final scores on a scale from 0 to 100.

*Note 3:* The ‘Normalized Values’ and ‘Weighted Values’ tabs are used for calculation of the final rankings. These tabs show intermediary steps in the final calculation and can be viewed if desired, though they are not necessary for understanding the final rankings.

**Making Changes:**

1. If you wish to add or delete Measures of Effectiveness or Alternate Optionsor change any other data that you entered, do the following:
   1. Make sure you have completed running the model. The reset will only work if you have pressed the ‘Generate Final Rankings’ button first. It is okay if you have not entered all the data, the model must finish this step even with zero values before it can reset. A message will appear if you attempt to reset before doing this.
   2. Go back to the ‘Input MOE’ tab and click the ‘Reset Matrix’ button. This will erase the data in all of the tables except for those on the ‘Input MOE’ tab. However, this button will also create a backup of any raw data you previously entered into the ‘Weight Matrix’ tab. This backup table is located on the ‘Weight Matrix Backup’ tab.
   3. Once you have clicked the ‘Reset Matrix’ button, you may now add or delete items on the ‘Input MOE’ worksheet.
   4. When you are ready, click the ‘Create Matrix’ button again, and continue exactly as before.
   5. You may do this as many times as you need.
2. **Note: Upon creating the updated matrix, this table will populate any values you had previously entered from the backup tab. If you are changing the numbers of the raw data, make sure to review the numbers for accuracy before continuing on to get the final rankings.**